

Even Smallest Land can be ploughed with a Tractor – Thanks to Innovation by ACI Motors Team

It is a common cliché in Bangladesh that 4-wheel tractors are bigger in size and cannot operate in small land sizes as per requirement of Bangladeshi Farmers. To overcome this challenge, through continuous development approach by ACI Motors' service & product development team in an integration of International Tractors Ltd. R&D team; the turning radius of the tractor was re-engineered to be at a minimum level; which helped the tractor to be effective at

smaller land sizes. Also, higher capacity engines helped to increase the backup torque of the tractor for more cultivation efficiency.

Through this technological innovation, now Tractors can efficiently plough even smallest size lands in Bangladesh.

Dr. F H Ansarey
Managing Director & CEO
ACI Agribusiness



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Newer technology to break the yield plateau of crop varieties



Recently, a group of scientists at Cold Spring Harbor Laboratory, NY has utilized the power of CRISPR technology in creating numerous variants of tomato, which show significant improvement in three major agriculturally important traits, namely fruit size, branch architecture, and overall plant ideotype. Although the work only involved tomato, the group says that it is applicable to all sorts of food, feed and fuel crops.

The work mainly involved using CRISPR to introduce various mutations in promoters such as the SICLV3 (and many others) of tomato, making it possible for the group to control the number of floral organs and locules related to changes in stem cell number of the plant. By making multiple changes in the regulatory regions with the help of CRISPR “scissors”, they were able to induce a wide range of variation in the three targeted traits. “Each trait can now be controlled in the same way a dimmer switch controls a light bulb.” said CHSL Professor Zachary Lippman, who led the research.

Other than tomato, the CRISPR technique has also been used in several other crops for desired genome editing including maize, rice, potato, etc. In many of these cases, this was not only used to amplify yield but also in creating better disease and drought resistant materials. And in each it proved to be a powerful tool. As the human population continues to increase at an alarming rate, higher productivity of all agricultural crops needs to be increased. Because the current crops will be unable to meet

the high demand unless still higher yields are obtained from newer materials. The gene/point mutation creates by nature takes long time, but the process can be made faster using CRISPR and other gene specific technology for desirable traits. CRISPR not only offers the ability to fine-tune each gene at the transcription level but can also help to break the yield plateau already reached in many crop varieties. This is one of the latest gene editing system with a lot of potentials. However, Dr. Abu Yusuf Akhand of BARI indicates that, while this technology can be very effective for the betterment of animal health, crops, as well as human health, but not the only system; there are others like 'Zinc-finger nuclease' and TALEN systems and like any newly developed technique, CRISPR is not perfect yet and has its problems like 'off-target effects', for which many practical applications are not coming out yet. Thus, the technique needs further refining and there are already better versions available. As scientists working on crop improvement, their efforts should focus more on 'genetics & breeding' especially genetics where there is weakness in present system. Another issue with CRISPR is that it has a strong patent portfolio by companies. While many scientists see CRISPR as just another biotechnological tool with great potential, some of them even predicted that a better tool would soon replace the existing system.

Prof. Lutfur Rahman,
Advisor, Agribusinesses & Editor, Biolife

Events and Activities

Retailer Meeting on Pumpkin Sweet Baby & Sweet Lady

On 19 September 2017, a retailer meeting was arranged by ACI Seed at Baganchara, Sharsha, Jessore to introduce its higher-yielding pumpkin varieties e.g. Sweet Baby & Sweet Lady. Around 40 participants of the seed hub attended the program. Sweet Baby is a year-round pumpkin variety with early maturity, excellent fruit setting, high yield (16-18 t/ac), thick flesh and attractive yellow color. The weight range is 3-5 kg and reaches maturity in 75-80 days after sowing. Sweet Lady is an early maturity variety with excellent

fruit setting, high yield (20-25 t/ac), high flat shape, weight 3-4 kg, and maturity in 80-85 days after sowing. It is suitable for September – January planting. Sharsha is a promising seed market for pumpkin. The participants have received the information enthusiastically and are motivated to promote as these varieties have great USP with good traits of customer satisfaction. Sales Manager, RSM, ASM and MO from ACI Seed attended the program.



Booking Programs for Organic Fertilizer in Comilla & Bogra

Outstanding booking programs for Organic Fertilizer were organized by ACI Fertilizer at Hotel Siesta in Bogra on 21 September 2017 and Hotel Red Roof Inn in Comilla on 24 September 2017. The objective of the programs was to boost the sales targeting Potato season and formulate plans for upcoming days. Organic Fertilizer is a prominent product of ACI Fertilizer. It perfectly fulfills the need of Organic matters of soil and increases the ability of the soil to absorb the nutrients. Moreover, it enhances soil's water containing power and fertility.

Above all, it reduces the use of chemical fertilizer up to 25%. The programs were inaugurated by Md. Bashir Ahmed, Business Director (BD) of ACI Fertilizer.

Besides, ACI Fertilizer's Assistant Marketing Manager Md. Yusuf Alam, ACI Fertilizer APM Mr. Asadur Rahman; Sales Manager Md. Mustafizur Rahman Khan & Md. Firoz Hossain; ZSM/RSM of Comilla & Bogra; Area Executive and Managers of Comilla & Bogra adorned the program through their active presences.

Events and Activities

At the initiation of the programs, Mr. Bashir Ahmed, Business Director has given his valuable speech on Organic Fertilizer and its significances. Insights shared by him motivated the customers to increase the productivity of soil through proper and timely

application of the fertilizer. These types of program tend to promote and highlight the effectiveness through raising awareness among the customers so that they can be able to disseminate the information to the root level users of the fertilizer.



Grand Launching Program of NEB



Events and Activities



Grand memorable launching programs of NEB (Fertilizer Efficiency Improver) were held on 21 September 2017 and 24 of September 2017 at Hotel Siesta in Bogra and Hotel Red Roof Inn in Comilla respectively. Mr. Bashir Ahmed, Business Director, ACI Fertilizer was present during the

launching. Mr. Yusuf Alam, AMM, Mr. Asadur Rahman, APM, Mr. Firoz Hossain, SM of ACI Fertilizer and ZSM/RSM of Comilla & Bogra; Area Executive and managers of Comilla & Bogra were also present. NEB is a blend of natural ROOT EXUDATES, which helps to increase microbial activities. NEB fertilizer market includes the urea market of Bangladesh to increase the efficiency of nitrogen. The nitrogen level of the country is very poor. NEB can be used as 50% urea to increase microbial activities. It will also minimize 30% production cost of the farmers. It is deemed that the product will reduce the use of Urea by 1 Lac MT by 2020.



The programs started with cake cutting ceremony. Then the discussion sessions started. Mr. Bashir Ahmed, BD Fertilizer; Mr. Yusuf Alam, AMM; Mr. Firoz Hossain, SM; Mr. Mustafizur Rahman, SM; shared their valuable knowledge with the customers on NEB. The programs came to an end through a grand dinner.

Sonalika Day Service Campaign 2017



ACI Motors had successfully completed Sonalika Day Service Campaign in 61 territories during September 2017. During this campaign, ACI Motors provided free service to 2,166 tractors. Moreover, about 10,000 tractor customers and drivers received free medical services from the campaign. Throughout the campaign, 563 new

tractors were booked by the customers and 52 were delivered on spot. More than 50 Lac Taka worth spare parts were purchased by the customer during the service campaign. Sonalika Day Service Campaign 2017 was a part ACI Motors' relentless effort to provide customer service countrywide.



Events and Activities



Motorstar Summit 2017

ACI Motors arranged the Motorstar Summit 2017 at Cox's Bazar from 15-17 September 2017. The summit came as an occasion for annual review, reflection, and refreshment for all the members of ACI Motors from different portfolios. The first day of the summit was relaxing as the participants had sports time at the sea beach after checking in the hotel and having lunch. On 16 September 2017, the second day started with the welcome session Mr. Subrata-Ranjan Das, Deputy Executive Director, ACI Motors delivered the welcome speech. Dr. F.H. Ansarey, Managing Director and CEO of ACI Motors gave valuable direction on Quality Business Delivery during this session. Sessions on Different Portfolio Presentations and Group Presentation took place throughout the day. The third day of the summit started with the amazing Yamaha Stunt Show in Sea Palace Hotel, Cox's Bazar. HR Motivational Training and introduction of Corporate Guests were also on the day's agenda. Presentation from



Finance credit, GIS and MIS also took place. Finally, the summary presentation of all portfolios and review – Motorstar Summit Brief took place. Awards were presented in different categories during the closing session. The summit ended as participants celebrated with Fanush, Networking Event, Gala Dinner, and Cultural Program.

Events and Activities



Gene for Huge Juicy Tomatoes Identified



Farmers can grow big, juicy tomatoes thanks to a mutation in the Cell Size Regulator gene that occurred during the tomato domestication process. Esther van der Knaap of the University of Georgia, Athens and colleagues describe this gene variant in a study published in open-access journal PLOS Genetics on August 17th, 2017. When humans first began cultivating the wild tomato in the Andean mountain regions of Ecuador and Northern Peru, they continually selected plants that produced larger fruits. Now, thousands of years later, tomatoes on the market can weigh 1,000 times more than the fruits of their ancestors. In the current study, researchers investigated a gene they named Cell Size Regulator, or CSR, that boosts fruit weight by increasing the size of the individual cells in the pericarp, which is the fleshy part of the tomato. Compared to wild tomatoes, domesticated varieties carry a mutation in the CSR genes that shortens the resulting protein in tomato cells, and that truncation likely affects its role in regulating cell differentiation and maturation in the fruit and vascular

tissues. The variation originated in the cherry tomato but now appears in all large cultivated tomato varieties.

The new study expands on previous research that had identified the location of CSR at the bottom of chromosome 11 as only a small genetic contributor to tomato weight. Now with the cloning of the gene, the finding that most cultivated tomatoes carry the shortened version of the CSR gene suggests that humans selected this genetic variation extensively and that it was critical to the full domestication of tomato from its cherry tomato ancestors. "CSR is required to create the large tomatoes that are needed for the industry. This is because large tomatoes critically raise the profit margins for farmers. The knowledge of the gene will now open up avenues of research into how fruit size can be increased further without negatively impacting other important qualities such as disease resistance and flavor," says Dr. van der Knaap.

(Source: Agriculture and Food News, ScienceDaily, www.sciencedaily.com)



Diversity in tomato fruit weight is explained in part by a mutation in the Cell Size Regulator gene that arose during domestication.
Photo Credit: Alexis Ramos and Esther van der Knaap

Clay-Based Antimicrobial Food Packaging

Sometimes it seems as if fresh fruits, vegetables and meats go bad in the blink of an eye. Consumers are left feeling frustrated, often turning to less expensive processed foods that last longer but are less nutritious. Now scientists report that they have developed a packaging film coated with clay nanotubes packed with an antibacterial essential oil. The film provides a one-two punch, preventing over-ripening and microbial growth, which could help improve the shelf life of perishables. The researchers presented their results at the 254th National Meeting & Exposition of the American Chemical Society (ACS).

"Food packaging that is capable of interacting with food can contribute to safety and prevent economic losses from spoilage," Hayriye Ünal, Ph.D., says. "Specialized films that can preserve a wide array of foods are highly sought after." People around the world have been trying to preserve fruits, vegetables and meats since ancient times. From the traditional methods of salting or fermenting to the more modern methods of canning, freezing or wrapping in plastic films, food preservation has always been important. According to the U.S. Department of Agriculture, about 30 to 40 percent of the food that farmers



Control tomatoes (left) rotted after six days while those wrapped in a new clay-based film (right) stayed fresh

Photo Credit: Hayriye Ünal

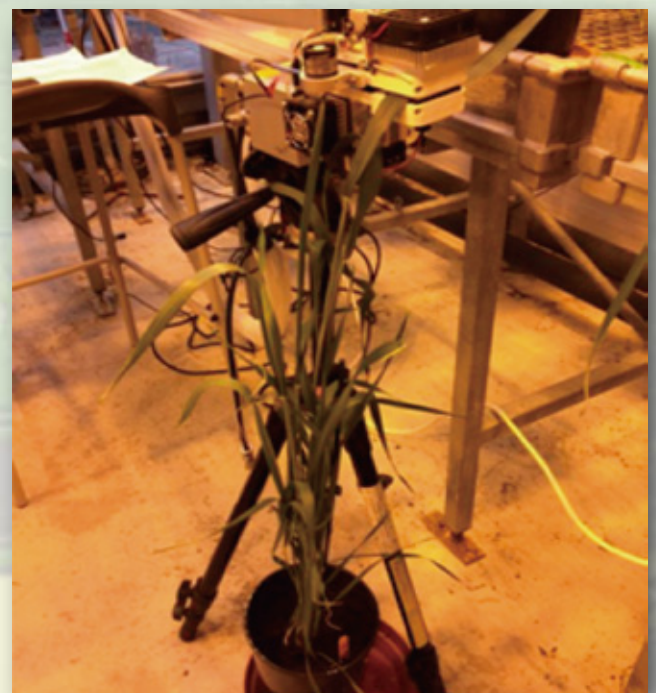
produce in the country goes to waste. Sometimes, busy people just don't have enough time to eat all of the fresh food they buy, but other times food spoils at the grocery store because consumers avoid purchasing imperfect fruits, vegetables and meats.

(Source: American Chemical Society. www.acs.org)

Ray of Hope for More Abundant Wheat Crops

Crops such as wheat could be up to 21% more efficient at turning the sun's energy into food, according to new research by Lancaster University. The food chain relies on plants using sunlight to turn carbon dioxide from the air into food. This process, known as photosynthesis, is essential for plants to grow, including crops like wheat. However, when a leaf returns to full sunlight after a period in the shade, it takes some time for photosynthesis to regain peak efficiency, meaning valuable energy from the sun is wasted. This clearly reduces crop productivity, but until now, the scale of the issue had not been experimentally quantified.

Using infra-red gas analyzers connected to a miniature controlled environment chamber, Dr Samuel Taylor and Professor Steve Long, at the Lancaster Environment Centre (LEC) simulated a sudden increase in sunlight following shade, and measured the time it took for the plant to regain its maximum photosynthesis efficiency and take full advantage of the extra energy from light.



Leaf chamber experiment.

Photo Credit: Lancaster University

Agri-tech & Communication

They found it took about 15 minutes for photosynthesis to reach maximum efficiency. Based on the light fluctuations that would occur in a wheat crop, they then calculated how much less carbon dioxide the crop was absorbing over the course of a day because of this slow adjustment. The surprising result was 21%. Plant scientist Professor Long of Lancaster University and the University of Illinois said:

"This is a very significant loss. The next step is to seek out varieties of wheat which respond quickly to this increase in sunlight availability. We could potentially harness this trait and breed it into our modern wheat varieties to increase our harvests."

(Source: Agriculture and Food News, ScienceDaily. www.sciencedaily.com)

Turning Pollen into a Low-Cost Fertilizer

As up with demand. One tactic involves boosting crop yields. Toward that end, scientists have developed a method to make a low-cost, biocompatible fertilizer with carbon dots derived from rapeseed pollen. The study, appearing in ACS Omega, found that applying the carbon dots to hydroponically cultivated lettuce promoted its growth by 50 percent. Equipped with exceptional mechanical, thermal, optical and the world population continues to balloon, agricultural experts puzzle over how farms will produce enough food to keep electrical properties, carbon nanomaterials are commonly associated with complex devices. Surprisingly, these materials could also have potential agricultural applications -- some studies have shown that they increase plant growth. The problem with this concept, however, is that many carbon nanomaterials are expensive to produce and usually come with heavy metal contamination. For a safer alternative, Yingliang Liu, Bingfu Lei and colleagues turned to carbon dots, which previous studies have shown are biocompatible.

The researchers synthesized carbon dots by breaking apart and heating rapeseed pollen. The high-yield process was relatively inexpensive, costing 3 cents per gram. Testing the material as



Lettuce grows larger when fertilized with pollen-derived carbon dots.

Photo Credit: American Chemical Society

fertilizer on lettuce showed that at a concentration of 30 milligrams per liter of a nutrient solution, the plant biomass was nearly 50 percent greater in treated plants than those that didn't receive the carbon dots. Additionally, because carbon dots are fluorescent, the researchers could track the materials under ultraviolet light. They saw that the materials were distributed mainly in the leaves. Further analysis also demonstrated that the levels of vitamin C, and soluble sugars and proteins weren't affected.

(Source: American Chemical Society. www.acs.org)

New Food Crops to Diversify the Farm

What if we could design a landscape that would provide a variety of nutritious foods, high-quality habitat, and ecosystem services, while also delivering a healthy profit to the landowner? According to University of Illinois researchers, it is not only possible, it should be adopted more widely, now. "We need to be on the road to figuring things out before we get to tipping points on climate change or food security, or we could be left way behind. In future environments, people might get paid for ecosystem services or carbon credits, or food might become more valuable. If so, these systems become much more attractive for landowners," says Sarah Taylor Lovell, an agroecologist in the Department of Crop Sciences at U of I. Lovell believes multifunctional woody polyculture is the way forward. She and several co-authors introduce the concept and discuss their experimental design in a recent paper published in *Agroforestry Systems*.

Essentially, the idea is to incorporate berry- and nut-bearing shrubs and trees in an alley cropping system with hay or other row crops. The combination is meant to mimic the habitat features, carbon storage, and nutrient-holding capacities of a natural system. "We wanted to capture that aspect, but we also wanted it to be commercially viable," Lovell says. "The trees and shrubs need to fit in perfect linear rows 30 feet apart, so you can fit equipment. That was a much more practical agronomic consideration." Lovell and her colleagues are three years into



Schematic of multifunctional woody polyculture plots.

Photo Credit: Image courtesy of University of Illinois College of Agricultural, Consumer and Environmental Sciences (ACES)

what they hope will be a long-term experiment on the U of I campus. Their trial consists of seven combinations of species in commercial-scale plots, from simple combinations of two tree species to highly diverse combinations including multiple species of trees, shrubs, and forage crops. "We added increasingly diverse systems so we can get a sense of how much is too much diversity in terms of trying to manage everything in a feasible way," she says.

(Source: Agriculture and Food News, ScienceDaily, www.sciencedaily.com)

Injecting Manure Instead of Spreading On

With water quality in the Chesapeake Bay suffering from excess nutrients and fish populations in rivers such as the Susquehanna experiencing gender skewing and other reproductive abnormalities, understanding how to minimize runoff of both nutrients and endocrine-disrupting compounds from farm fields after manure applications is a critical objective for agriculture. A new study by researchers in Penn State's College of Agricultural Sciences shows that applying manure to crop fields by means of shallow disk injection into the soil rather than traditional surface broadcast significantly reduces estrogens in surface runoff. This finding suggests that manure-application methods can be used to control the mobilization potential of estrogens and points to opportunities for protecting downstream water quality.



The method of animal manure application can influence the availability of nutrients and estrogens to runoff water. Several Penn State studies have shown the potential benefits of shallow disk injection (shown here) for reducing phosphorus and nitrate transport in surface runoff compared to surface broadcasting. Just published research demonstrated significantly reduced estrogen transport in runoff from shallow disk injection plots relative to surface broadcast plots. The inset photo shows injectors.

Photo Credit: Michael Houtz

Agri-tech & Communication

The research, published in August in *Agriculture, Ecosystems and Environment*, also investigated how manure-application methods affected runoff of total dissolved phosphorus and dissolved organic carbon. Researchers found that transport rates of those nutrients, to a lesser degree, also were lower after manure injection than after surface broadcast. Earlier findings from the study, which was conducted from

October 2014 through the summer of 2015, were published in the *Journal of Environmental Quality* in November 2016. The research sampled 10 surface runoff events from 12 research plots -- six with each application method -- after the fall application of manure.

(Source: *Agriculture and Food News*, ScienceDaily, www.sciencedaily.com)

Key to Drought-Tolerant Crops in the Leaves?

A solution to help farmers to grow crops in dry areas or during stretches of drought may depend on breeding and cultivating plants that protect themselves with a thicker layer of leaf wax, a new study shows. Sarah Feakins, a scientist at USC who has studied leaf wax in the context of climate change, teamed up recently with researchers at Texas A&M University to research and develop drought-resistant crops. During tests with growing winter wheat, a type harvested for yeast-based breads and other such products, the team found that the cultivars in a high and dry area of Texas generated more protective wax on their leaves as a measure to protect themselves against more extreme conditions.

The results mimicked what scientists have found in leaves in natural ecosystems: Those that survive in dry climates have higher concentrations of wax. "Water conservation depends on innovation, and in this case, we are hoping to find one solution by identifying the traits in this important food crop that would enable the wheat plants to tolerate drought and still produce plenty for harvest," said Feakins,



Researchers at USC and Texas A&M University grew winter wheat in an arid area of Texas with reduced irrigation and found that the plants protect themselves by producing thick leaf wax.

Photo Credit: Xiuwei Liu, Texas A&M University

a co-lead author of the study and an associate professor of earth sciences at the USC Dornsife College of Letters, Arts and Sciences.

(Source: *Agriculture and Food News*, ScienceDaily, www.sciencedaily.com)

Nesting Aids Make Agricultural Fields Attractive for Bees

Farmers are facing a problem: Honeybees are becoming ever rarer in many places. But a lot of plants can only produce fruits and seeds when their flowers were previously pollinated with pollen from different individuals. So when there are no pollinators around, yields will decrease. But honeybees are not the only insects that do this crucial job. The various

species of wild bees, too, are busy pollen collectors and pollinate a number of crops in the process. However, their importance has long been underestimated. But we now know that the yields of many crops increase noticeably when not only honeybees but also their "wild" relatives are abundant in fields.

Agri-tech & Communication

"So we studied how the number of bees on agricultural land can be increased with sustainable effect," Ingolf Steffan-Dewenter explains. For this purpose, the qualified beekeeper and Professor of Animal Ecology and Tropical Biology at the Julius-Maximilians-Universität (JMU) Würzburg in Bavaria, Germany, together with his team and colleagues from the University of Wageningen investigated several landscapes with rapeseed fields. The study was conducted within the scope of the EU project STEP (Status and Trends of European Pollinators). The examined areas were located around Würzburg and in the Netherlands. First, the biologists installed so-called nesting aids at the edges of the fields -- these are short bundles of reed in which the insects can lay their eggs. Over the next two years, they studied how many brood cells were produced in these nests and from which species.

(Source: Agriculture and Food News, ScienceDaily. www.sciencedaily.com)



Nesting aids at the edges of fields can increase the numbers of wild bees: The insects lay their eggs in short bundles of reed.

Photo Credit: Verena Rieding



Believe it or not!



- Lychee is perennial plant that can survive around 1.000 years in the wild.
- Lychees continue to mature until they are picked.
- Chinese emperors and other wealthy Chinese prized lychees, so much so, that it caused high demand and a significant consumption rate throughout the centuries.
- This fruit is symbol of love and romance in China.
- Lychee is also known as "Chinese strawberry" because it originates from China and looks like strawberry.



Nutrition Chart

Lychee (100 grams)	
Calories	66
Sugar	15 g
Total Fat	0.4 g
Protein	0.8 g
Potassium	171 mg
Sodium	1 mg
Dietary fiber	1.3g

Source: USDA

Agro Tips

Lychee has so many health benefits. As Example:

- Lychees can be used for cough treatment.
- A little molecular weight polyphenol is found in Lychee fruit.
- Lychee fruit controls heart rate, blood pressure and reduces the risk of stroke.
- Lychee has no saturated fats or cholesterol but comprises of good amounts of dietetic fiber, vitamins, and antioxidants.
- Dietary fiber in Lychee fruit helps in it also stimulates gastric and digestive juices.

Sharing is caring!

Lychee can be consumed fresh, in the form of fruit salads, or it can be used for the preparation of ice-creams, juices, jellies, jams, syrups and various refreshing beverages and tea. Lychee is also available in dried and canned form.



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